

WHAT IS CLAIMED IS:

1. A bead array chip manufacturing apparatus, which comprises:
  - a stage for supporting a bead storing plate having a plurality of bead storing portions,
  - a stage driving portion for driving the stage,
  - a container retaining portion for retaining a container having a plurality of first channels disposed substantially in parallel with each other and a second channel crossing therewith,
  - a capillary which is movable and passes through the second channel of the container,
  - a capillary driving portion for vertically moving the capillary,
  - a suction unit connected to the upper end of the capillary for generating a suction force at the lower end of the capillary,
  - a fluid circulating unit for generating a uniflow of a fluid in the first channels of the container retained by the container retaining portion, and
  - a controlling portion for controlling the stage driving portion, capillary driving portion, suction unit and fluid circulating unit; and manufactures a bead array chip in which beads stored respectively in the plurality of storing portions of the bead storing plate are arrayed in a predetermined order in the first channel of the container.
2. A bead array chip manufacturing apparatus of Claim 1, wherein the capillary driving portion drives a plurality of capillaries simultaneously and the container retaining portion retains the number of the containers equal to those of the capillaries.
3. A bead array chip manufacturing apparatus of Claim 1, wherein the capillary has an inner diameter smaller than the diameter of the bead and an external diameter greater than the diameter of the bead but not greater than twice as much as the diameter of the bead.
4. A bead array chip manufacturing apparatus of Claim 1, wherein the container retaining portion further comprises a first retaining member having a flow channel linked to one end of the first channel and retaining one end portion of the container, and a second retaining

member having a flow channel linked to the other end of the first channel and retaining the other end portion of the container; and the fluid circulating unit further comprises a fluid injection unit connected to the first retaining member and a fluid suction unit connected to the second retaining member.

5. A bead array chip manufacturing apparatus of Claim 1, wherein the bead has a diameter ranging from 10  $\mu\text{m}$  to 500  $\mu\text{m}$  and has a surface immobilized with a biomolecular probe.

6. A bead array chip manufacturing process for manufacturing a bead array chip having plural kinds of beads arrayed in a predetermined order in, in a container having a plurality of first channels disposed substantially in parallel with each other and a second channel crossing the plurality of first channels, each of the first channels, which comprises:

lowering a capillary inserted in the second channel and sucking and retaining one bead in one end of the capillary,

lifting the capillary to position the beads retained in the one end of the capillary in the desired channel of the plurality of first channels,

terminating the suction of the capillary, and

generating a uniflow of a fluid in the second channel.

7. A bead array chip manufacturing process of Claim 6, further comprising disposing a plurality of the containers and simultaneously driving a plurality of the capillaries each inserted in the second channel of the containers.

8. A bead array chip manufacturing process of Claim 6, wherein the bead has a surface immobilized with a biomolecular probe.